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# Company Profile

**World-class leading edge with MOCVD**

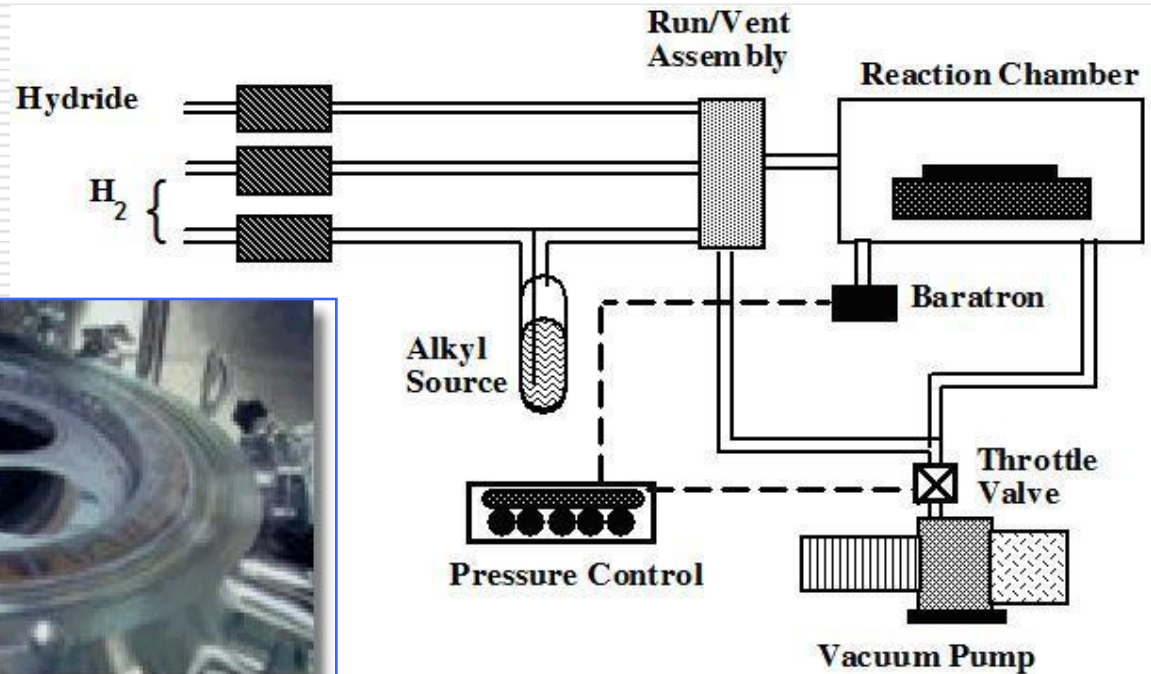




# Core Technology

## MOCVD (有機金屬氣相沉積法)

- Metal Organic Chemical Vapor Deposition





# Core Technology

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Production  
Reactor

MOCVD Metal Organic Chemical Vapor Deposition

Way to  
Produce

Through the organic metal chemical vapor deposition method, the semiconductor film is grown on the substrate, and the epitaxial layer is accurately controlled through the real-time monitoring of the machine to complete the production of epitaxial wafers for different products such as GaAs、InP and GaN.

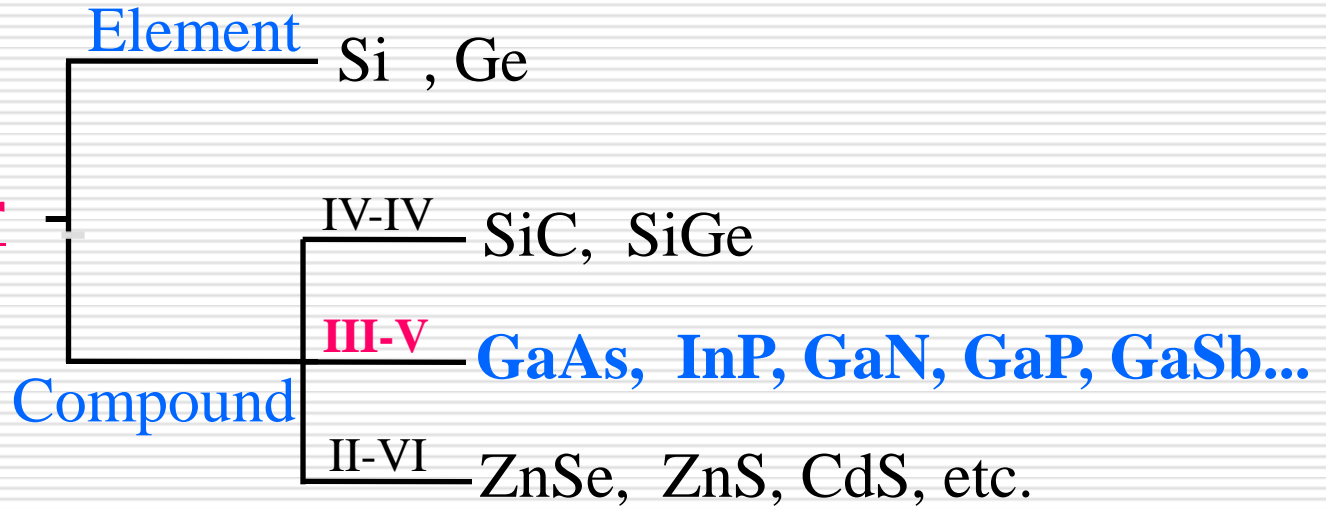
Production  
Principle

The epitaxial layer is heated by MOCVD in the cavity of the substrate, and an atomic layer is stacked layer by layer to form an epitaxial layer.



# Semiconductor (by Material)

## Semiconductor



Period	Column II	III	IV	V	VI
2	Be 鈹 Beryllium	B 硼 Boron	C 碳 Carbon	N 氮 Nitrogen	O 氧 Oxygen
3	Mg 鎂 Magnesium	Al 鋁 Aluminum	Si 矽 Silicon	P 磷 Phosphorus	S 硫 Sulfur
4	Zn 鋅 Zinc	Ga 鎵 Gallium	Ge 鍺 Germanium	As 砷 Arsenic	Se 硒 Selenium
5	Cd 鎘 Cadmium	In 銦 Indium	Sn 錫 Tin	Sb 銻 Antimony	Te 碲 Tellurium
6	Hg 汞 Mercury	Tl 鉍 Thallium	Pb 鉛 Lead		

二元化合物 Binary : GaAs, InP, GaP, GaN, etc.

三元化合物 Ternary : InGaAs, InGaP, AlGaAs, etc.

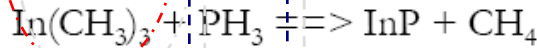
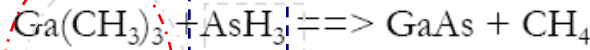
四元化合物 Quaternary : AlGaInP, InGaAsP, etc.

五元化合物 Pentanary : AlGaInAsN, etc.



# Chemical Reaction During Epitaxy

化學反應式：



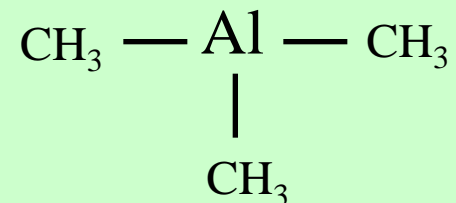
主要原物料：

**MO Source** + **Hydride** + Carrier Gas : **H<sub>2</sub>**

- TEAl : Tri-ethyl-Aluminum ( C<sub>2</sub>H<sub>5</sub> )<sub>3</sub>Al
- TMGa : Tri-Methyl-Gallium ( CH<sub>3</sub> )<sub>3</sub> Ga
- TMIn : Tri-Methyl-Indium ( CH<sub>3</sub> )<sub>3</sub>In
- DETe : Di-ethyl-Tellurium ( C<sub>2</sub>H<sub>5</sub> )<sub>2</sub>Te
- DEZn : Di-ethyl-Zinc ( C<sub>2</sub>H<sub>5</sub> )<sub>2</sub>Zn
- CP<sub>2</sub>Mg : Bis (cyclo-penta-dienyl) -Magnesium 環戊二烯鎂

- AsH<sub>3</sub> : Arsine
- PH<sub>3</sub> : Phosphine
- SiH<sub>4</sub> : Silane
- Si<sub>2</sub>H<sub>6</sub> : Disilane
- H<sub>2</sub>Se : Hydrogen Selenide
- CBr<sub>4</sub> : Carbon Tetrabromide

TMAI    Tri - Methyl - Aluminum ( CH<sub>3</sub> )<sub>3</sub>Al  
 三 甲 基            鋁





# Advantages of Compound Semiconductor

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1. High Electron Mobility 高電子移動速率 (5.7x higher than CMOS)
2. High Frequency Response 高頻率響應
3. Wide Band Width 寬幅之頻寬
4. High Linearity 高線性度
5. High Power 高功率
6. Alternative Choice of Material 材料選擇多元性
7. 抗輻射

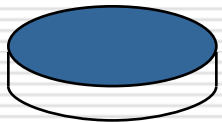
適用於無線通訊、光通訊、雷射



# GaAs in Wireless Communication Supply Chain

Sumitomo, Freiberg, AXT

2~6 "GaAs Substrate

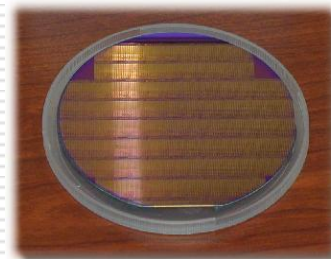


GaAs Epi- Wafer  
磊晶片



IDM : Qorvo, Avago,  
Skyworks

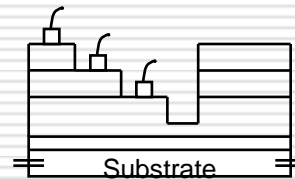
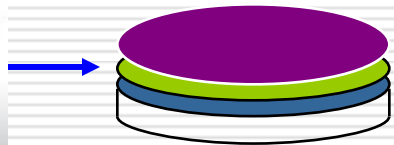
Microelectronics  
IC Process



Wireless  
Communication



MOCVD Reactor



Foundry :

WIN, AWSC,  
GCS



IC Package & Testing



# 2019-2022Q3 Financial Result

	2022Q1 ~ Q3	%	2021	%	2020	%	2019	%
Revenue	2,097,562	100.00%	3,608,521	100.00%	2,645,003	100.00%	2,530,909	100.00%
Gross margin	887,994	42.33%	1,519,713	42.11%	1,114,404	42.13%	1,034,272	40.87%
Operating Profit	516,679	24.63%	1,056,519	29.28%	687,515	25.99%	648,983	25.64%
Non-operating income & expense	100,058	4.77%	-3,842	-0.11%	-40,212	-1.52%	-20,380	-0.81%
Tax	-109,042	-5.20%	-197,596	-5.48%	-114,715	-4.34%	-114,278	-4.52%
Net income	507,695	24.20%	855,081	23.70%	532,588	20.14%	514,325	20.32%
EPS	2.75		4.62		2.88		2.79	





# 2022 Outlook-Microelectronics

### 5G Mobile Penetration



### WiFi6 / 6E



### IoT Smart Link



**Micro  
Electronics**

### V2X PA

### LEO Satellite

### 5G Base Station

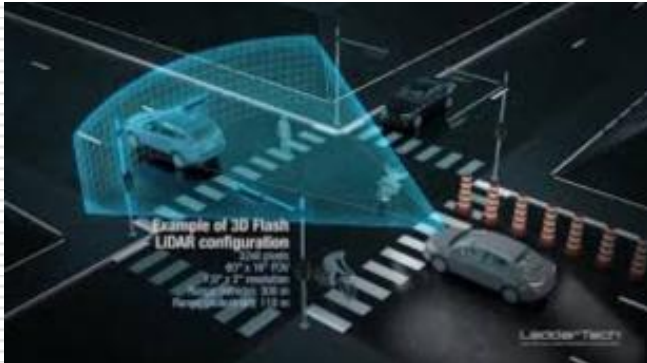
### Military





# 2022 Outlook-Optoelectronics

Car LiDAR



AR / VR Sensing



Opto  
electron  
ics

Robot Vacuum Sense



Special Heat/IR Imaging



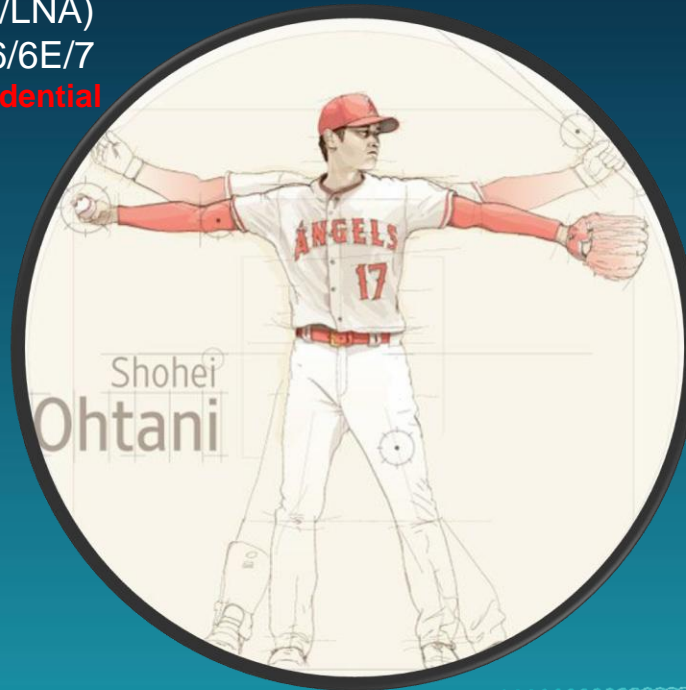
## AR / VR

Emitter: VCSEL  
Detector: PD  
Eye-safety

## Wireless

HBT (PA)  
pHEMT (Switch/LNA)  
WiFi 6/6E/7

**VPEC Proprietary and Confidential**



## LiDAR Turnkey Solution

Emitter: VCSEL, EEL  
Detector: PD, APD  
Eye-safety (1400nm ~ 1600nm)  
Long Range Detection (400m)

## V2X

HBT (PA)  
pHEMT (Switch/LNA)  
WiFi 6/6E/7

